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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,033	10/20/2003	Yezdi Dordi	AMAT/2601.C10/CMP/ECP/RKK	4008
44257	7590	03/28/2006	EXAMINER	
PATTERSON & SHERIDAN, LLP 3040 POST OAK BOULEVARD, SUITE 1500 HOUSTON, TX 77056			ZHENG, LOIS L	
			ART UNIT	PAPER NUMBER
			1742	

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/690,033

Applicant(s)

DORDI ET AL.

Examiner

Lois Zheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/27/06, 10/24/05, 8/8/05, 12/9/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Original claims 12-22 are misnumbered. Since there are total of 25 claims, the examiner has renumbered claims from 1 to 25 in the order they appear in the claims filed 20 October 2003.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1-5 and 7-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Reid et al. US 6,126,798(Reid).

Reid teaches an electroplating apparatus comprising a cell body, an anode positioned in the lower portion of the cell body supported by an anode cup, a first membrane positioned across the cell body above the anode(Fig. 2 numerals 42A, 202, 206, 208).

Regarding claim 1, the volume between the membrane and the top opening of the cell body as taught by Reid reads on the claimed first fluid volume. The volume between the membrane and the anode cup as taught by Reid reads on the claimed second fluid volume. Reid also teaches a first fluid inlet in fluid communication with the

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first fluid volume, a second fluid inlet in fluid communication with the second fluid volume(Fig. 2 numerals 200, 228/236), and a fluid outlet in fluid communication with the second fluid volume(Fig. 2 numerals 240/242).

Regarding claims 11 and 19, the cell body of Reid is configured to contain a plating solution and having an opening sized to receive a substrate for plating as claimed. The solution above the membrane as taught by Reid reads on the claimed plating solution. The solution between the membrane and the anode cup as taught by Reid reads on the claimed fluid volume adjacent the anode. The first fluid inlet as taught by Reid reads on the claimed plating solution inlet. The second fluid inlet as taught by Reid reads on the claimed anode fluid inlet. Reid further teaches the claimed anode fluid outlet(Fig. 2 numerals 240/242).

Regarding claim 2, the first fluid inlet as taught by Reid is positioned to direct some of the fluid around the anode and out the fluid outlet as claimed.

Regarding claims 3 and 16, the wall of the anode cup as taught by Reid reads on the claimed support ring. Reid further teaches the claimed second membrane below the anode(Fig. 2 numeral 204).

Regarding claim 4, Reid teaches the electrical connection as claimed (Fig. 3 numeral 212B).

Regarding claim 5, the second fluid inlet(Fig. 2 numeral 228) as taught by Reid is positioned below the anode and configured to direct a plating solution upward through the plating cell toward a substrate being plated as claimed.

Regarding claim 7, Reid further teaches that the anode outlets(i.e. second fluid outlets)(Fig. 2 numerals 240 and 242) are positioned at the top of the wall of the anode cup, which allows the entrapped gas bubbles to be removed easily(col. 7 lines 36-40). Therefore, the anode outlets as taught by Reid also read on the claimed degasser in communication with the first fluid inlet.

Regarding claims 8 and 13, Reid further teaches that the membrane may be napped polypropylene, spunbond snowpro polypropylene, various polyethylene. These materials are hydrophilic as claimed.

Regarding claims 9, 14 and 25, Reid further teaches that the second fluid inlets(Fig. 2, numerals 228, 236) can be separately connected and controlled from the first fluid inlet(Fig. 6 line 59 – col. 7 line 5). Since the first and second fluid inlets can be separately controlled, the examiner asserts that the second fluid inlet(i.e. anode fluid inlet) in the electroplating apparatus of Reid is inherently capable of supplying a fluid at a higher pressure than the first fluid inlet(i.e. plating solution fluid inlet) as claimed.

Regarding claim 10, due to the presence of the overflow weir(Fig. 1 numeral 54)(i.e. fluid outlet in fluid communication with the second fluid volume), the first and second fluid inlets as taught by Reid are configured to direct a fluid over the anode and remove the fluid from the plating cell without the fluid contacting the substrate as claimed.

Regarding claim 12, Reid teaches that the anode is a soluble metal as claimed (col. 5 lines 9-20).

Regarding claim 15, the electroplating cell of Reid has an opening that comprises a fluid outlet for the plating solution as claimed(Fig. 1 numeral 54).

Regarding claim 17, the plating solution inlet(i.e. first fluid inlet) as taught by Reid is configured to supply a plating solution to the plating cell without the plating solution contacting the anode as claimed.

Regarding claim 18, the fluid volume adjacent the anode as taught by Reid is separated from the plating solution by the membrane as claimed.

Regarding claim 20, the membrane of Reid is a porous fluid permeable membrane as claimed(col. 5 lines 21-40).

Regarding claim 21, Reid teaches the claimed filter membrane.

Regarding claim 22, the membrane and the anode cup of Reid forms the claimed enclosure positioned around a perimeter and bottom portions of the anode.

Regarding claim 23, the wall of the anode cup as taught by Reid reads on the claimed plastic ring surrounding the perimeter of the anode. The membrane below the anode as taught by Reid reads on the claimed bottom encapsulation membrane.

Regarding claim 24, the plating solution inlet(i.e. first fluid inlet) as taught by Reid is positioned to direct plating solution upward through the plating cell toward a substrate immersed in the plating solution volume as claimed.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reid in view of Landau US 6,261,433 B1(Landau).

The teachings of Reid are discussed in paragraph 3 above. However, Reid does not teach the claimed fluid permeable diffusion member.

Landau teaches an electroplating apparatus comprising an anode in the lower portion of the cell body(Fig. 2). Landau further teaches a fluid permeable diffusion member positioned between the anode and the overflow weir of the cell body(Fig. 5, numeral 110).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the diffuser as taught by Landau into the electroplating apparatus of Reid in order to enhance flow uniformity across the substrate plating surface as taught by Landau(col. 13 lines 32-35).

6. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reid in view of Woodruff et al. US 6,228,232 B1(Woodruff).

The teachings of Reid are discussed in paragraph 3 above. However, Reid does not teach the claimed fluid permeable diffusion member.

Woodruff teaches an electroplating apparatus comprising a diffuser positioned between the anode and the overflow weir(Fig. 1 numeral 66).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the diffuser as taught by Woodruff into the electroplating apparatus of Reid

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in order to provide a more controlled distribution of the fluid plating bath across the surface of the wafer as taught by Woodruff(col. 2 lines 46-48).

7. Claims 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reid in view of Gagnon et al. US 5,616,246(Gagnon).

The teachings of Reid are discussed in paragraph 3 above. However, Reid does not explicitly teach that the claimed first membrane comprises a hydrophilic material.

Gagnon teaches a hydrophilic porous fluid permeable membrane that can be used in electroplating apparatus(abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the hydrophilic porous fluid permeable membrane as taught by Gagnon into the electroplating apparatus of Reid in order to block residue and debris harmful to the electroplating process without interrupting the current flow or metallic ion transport vital to the electroplating process as taught by Gagnon(col. 4 lines 5-13).

### ***Double Patenting***

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to



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be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-4, 6, 8, 10-11, 13, 15-16 and 18-23 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 3, 12-14 and 16-24 of U. S. Patent No. 6,258,220 B1(US'220). Although the conflicting claims are not identical, they are not patentably distinct from each other because US'220 teaches an electroplating apparatus comprising the claimed cell body, anode, hydrophilic membrane, anode fluid inlet, plating solution fluid inlet, anode fluid outlet, overflow weir and anode enclosure with substantially the same structure limitations.

10. Claims 1-16, 18-23 and 25 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 13, 17-19, 21-28, 40-42, 47 and 49-57 of U. S. Patent No. 6,635,157 B1(US'157). Although the conflicting claims are not identical, they are not patentably distinct from each other because US'157 teaches an electroplating apparatus comprising the claimed cell body, anode, hydrophilic membrane, anode fluid inlet, plating solution fluid inlet, anode fluid outlet, overflow weir and anode enclosure with substantially the same structure limitations.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ

ROY KING  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700